ATOMIC ENERGY newsletter®

A SERVICE FOR INDUSTRY BUSINESS ENGINEERING AND RESEARCH

ROBERT M. SHERMAN, EDITOR. PUBLISHED BI-WEEKLY BY ATOMIC ENERGY NEWS CO., 1000 SIXTH AVENUE, NEW YORK 18, N. Y.

October 5th, 1954
Vol. 12...No. 4

Dear Sir:

Approval for construction of what will be first nuclear reactor for industrial research has now been given by the USAEC to Armour Research Foundation, Chicago. Armour plans to use the reactor for investigations into such fields as sterilization of foods and drugs; high polymer studies of the structure of plastics, rubber and other materials; development of metals and alloys; and medical techniques. It is not intended that research on reactors themselves will be done. It is expected that the reactor will cost about $500,000. Armour will assume about one-third of the investment, with industries in the Chicago area invited to participate with subscriptions of $20,000 each. The reactor will be housed in a new 8,000 sq. ft. building on the Illinois Institute of Technology campus.

As a result of tests of thermonuclear and other weapons in the U.S.'s Pacific Proving Ground last Spring, the average total fall out over the United States has amounted to approximately 100 millicuries per square mile, as of the week of Sept. 23rd, 1954, according to John C. Bugher, director of the USAEC's division of biology and medicine. Dr. Bugher, addressing the Industrial Health Conference, at Houston, Texas, last fortnight, noted that while this amount of radioactivity is minute (less than 5% of the radiation to the body from cosmic rays and radium in the soil), it is possible with techniques available today to detect and measure it accurately, and this has been done for all regions of the U.S.....Meanwhile, a new series of atomic tests will be conducted at the Nevada Proving Ground by the USAEC starting early in 1955, probably about mid-February. The series will conform generally with those previously conducted in Nevada, including participation and support by the Department of Defense and the Federal Civil Defense Administration.

A Society of Nuclear Scientists and Engineers, which its founders say is to integrate and advance nuclear science and technology, has now been formed for those working professionally in the atomic energy field. The first major activity of the Society will be a three-day conference at Pennsylvania State College, June, 1955. Further information on the organization may be obtained from Urner Liddel, 1104 Fisher Bldg., Detroit, Mich.

A new book, described by Senator Clinton P. Anderson, a member of the Joint Congressional Committee on Atomic Energy as "an attack upon the Los Alamos Scientific Laboratory and which divides and misleads the American people" has now been issued by a New York publisher. Titled "The Hydrogen Bomb", its authors are Washington journalists. Gordon Dean, former Chairman, USAEC, said the book was "vicious and untrue". Mr. Dean pointed out that while the authors "claim to have had access to official reports, no official can be found today who will admit he gave them any documents". Dr. Norris Bradbury, director of the University of California's Los Alamos Scientific Laboratory, said that the book's attack on responsible, serious, dedicated people was so fantastic as not to be worth mentioning.

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BUSINESS NEWS...in the atomic energy field...

INTEREST IN NUCLEAR ENGINEERING FIRM ACQUIRED BY ROCKEFELLERS:- A minority interest in Nuclear Development Associates, Inc., White Plains, N.Y., has now been acquired by Laurance and David Rockefeller. The Rockefellers will be represented on the board of NDA by T. F. Walkowicz and H. Woodward. NDA, which is the senior independent nuclear engineering firm in the United States (established in 1948) now has, among its current projects, the nuclear design of a breeder reactor for the Detroit Edison nuclear power group, and the development of nuclear reactors for aircraft.

ECONOMIC ASPECTS OF NUCLEAR POWER TO BE STUDIED:- A two year research study into the peacetime uses of nuclear energy is now to be conducted by National Planning Association (Wash.) with funds provided by Resources for the Future, Inc. (The latter supported by the Ford Foundation.) The inquiry will be devoted primarily to the development which may be expected in the next five to twenty years in obtaining usable electrical energy using nuclear reactors as a heat source, according to H. Christian Sonne, board chairman of National Planning. The survey will include an analysis of those regions in the U.S. where the high cost or scarcity of conventional power might make nuclear power especially feasible.

INTEGRATED NUCLEAR FIRM ON NEW DESIGNING AND ENGINEERING JOB:- Vitro Corp. of America's engineering division is now designing and engineering a special biological laboratory for the U.S. Army's Chemical Corps., to be built at Camp Detrick, Md. The laboratory, with its related facilities and auxiliaries, will cost approximately $4 million; it is expected that the design will be completed this month. (Vitro Corp., only firm in the U.S. with operations in all phases of nuclear work, is presently active, through its divisions, in uranium milling and refining; nuclear engineering and research; and production of metals important in connection with nuclear reactors.)

EXPANSION PROGRAM AT HANFORD PLUTONIUM WORKS NEARS COMPLETION:- The expansion program at Hanford Works (Richland, Wash.), which is now nearing completion, will make the total capital investment there over $1 billion, General Electric Co. (which operates Hanford on a prime USAEC contract through its atomic products operation) has now revealed. The plant, which cost $350 million when it was built by du Pont for World War II, celebrated in the last fortnight its tenth anniversary of the start-up of the world's first large-scale plutonium producing reactor.

FINANCIAL NOTES:- General Nucleonics Corp. (New York) in a new issue put on the market last week, is now attempting to raise some $297,500. Proceeds will be used to further the firm's instrument manufacturing and distributing operations..... An analytical review of Union Carbide & Carbon has now been made by the brokerage house of Eastman, Dillon & Co. (15 Broad St., New York). UC&C, which operates Oak Ridge, Paducah, etc., has large interests in nuclear energy.

FINAL AGENDA FIXED FOR ATOMIC ENERGY CONFERENCE:- Phases of atomic work both in the United States and abroad will be covered in the 3-day conference in New York Oct. 13, 14, and 15 of the National Industrial Conference Board. Programs will cover The Current Outlook for Atomic Power Costs (L.R. Hafstad, USAEC director of reactor development, chairman); Significance of the Patents and Licensing Amendments to the Atomic Energy Act (E.B. Stason, Dean, Law School, University of Michigan, chairman); The Raw Materials Supply Picture (C. Williams, president and director, Battelle Memorial Institute, chairman); Public Safety and Reactor Operations (F.K. McCune, general manager, atomic products division, General Electric Co., chairman); Reactor Designs for Commercial Power (W.G. Whitman, head, Dep't. of Chemical Engineering, M.I.T., chairman); Use of Radioisotopes (J.C. Bugher, director, division of biology and medicine, USAEC, chairman); Economic Factors in Locating Reactors (J.W. McAfee, president, Union Electric Co. of Missouri, chairman); Market Potentials in Atomic Energy and Related Industries (L.R. Groves, vice-president, Remington-Rand, Inc., chairman); Company Planning and Organization (J.B. Merrill, vice-president, Sylvania Electric Products, Inc., chairman); and Uses for Low Power and Package Reactors (L.J. Haworth, director, Brookhaven National Laboratory, chairman). Representatives from Brazil, France, Italy, Belgium, and Canada will discuss atomic energy in those countries.

NEW PRODUCTS, PROCESSES & INSTRUMENTS...for nuclear work...

FOR INDUSTRIAL USE:- Model 2612 is a battery-operated Geiger-Muller survey meter for measuring alpha, beta, and gamma radiation. Completely redesigned by this manufacturer, the instrument is recommended for general purpose survey work in radioisotope laboratories. Since the instrument is said to be waterproof, it may be used as a field instrument for geological surveying for uranium ores. The instrument has three ranges: 0.2, 2, or 20 milliroentgens/hr. The instrument is provided with a choice of probes using a thin wall Geiger tube for both beta and gamma radiation of over 0.2 mev, or a thin mica end window counter for alphas, betas, and gammas.--Nuclear Instrument & Chemical Corp., Chicago 10, Ill.

FOR MEDICAL USE:- Model LAX14P, trade-named Scintimeter, when combined with this manufacturer's Model 14L-5 shield, makes up a scintillation well counter which the manufacturer claims is adopted to counting gamma radiation at maximum sensitivity and to changing samples at maximum speed. The assembly is recommended for clinical and laboratory studies, such as blood volume and red blood cell mass determinations, where the samples are small and the specific gamma activities are at levels as low as 0.00001 microcuries per milliliter.--R-C Scientific Instrument Co., Inc., Playa del Ray, Calif.

A new dosage form of oral diagnostic sodium radioiodide (iodine-131), in capsule form, trade-named Radiocaps, is recommended for diagnostic studies by a physician in patients suspected of having thyroid disease. The dosage is achieved through the adsorption, on the inner surfaces of special gelatin capsules, of definite amounts of reduced, carrier-free sodium radioiodide. Taken by the patient orally, they dissolve in the gastric contents, and release the iodide for adsorption into the blood stream.--Abbott Laboratories, N. Chicago, Ill.

RAW MATERIALS...prospecting, mining, & marketing...

UNITED STATES:- Colorado - J.R. Simplot Mining Co , of Boise, Idaho, has now disposed of 375 claims covering 11 square miles in the Bull Canyon Monogram Mesa area, three operating mines, and equipment, all in Montrose County, to Camoose Mines, Ltd., of Canada. Although the sale price was not disclosed, it was thought to exceed even the $10 million involved in the recent Vernon Pick sale of his Delta Mine to Floyd Odlum's Atlas Corp. The three operating mines, with an estimated $2.5 million of ore already blocked out to mine, will have their output trebled, under Camoose's plans. (Camoose is an old company with extensive zinc and lead properties in the northwest, as well as other uranium claims in Grand County; president is Phillip King, Jr., of New York City.).....The Old Texas Mining Co., of Dallas, Tex., says that it has sold 26 claims in the Rattlesnake Mountain area of Colorado to a Chicago group for $4 million. The Chicago group, headed by Gerald Gidwitz, chairman, Helene Curtis Industries, also own other uranium interests in the area. The property sold involves 26 of 30 claims located four miles northeast of Charles Steen's Mi Vada mine. Mining operations on the claims are being conducted by Minerals & Engineering Co., of Grand Junction, Colo.

CANADA:- At the Lake Athabaska uranium fields (in the Beaverlodge area Saskatchewan), mines now shipping ore are Nesbitt Labine and Rix-Athabasca; early ore shipments are planned by Consolidated Nicholson, Black Bay Uranium, and Uranium Ridge Mines, while underground workings are being conducted by National Explorations, Lorado, Cayzor Athabaska, Meta Uranium, and Bata Gamma Mines.

NEW BOOKS & OTHER PUBLICATIONS...in the nuclear field...

Radioactive-Waste Disposal in the Ocean. Factors to be taken into account when radioactive wastes are disposed of at sea, with recommendations for the use of this method. National Bureau of Standards Handbook #58. 51 pages. (20¢).....
Minerals Yearbook, 1951 Edition. A bound volume of some 90 chapters, all which previously had been issued as preprints; prepared by the Bureau of Mines. ($5.25)--Superintendent of Documents, Wash. 25, D.C.

Changes in Physical Properties of Polyethylene by Pile Irradiation at 80 deg. C. Work at Britain's Atomic Energy research establishment.--British Information Services, New York 20, N.Y. (65¢)

THE OUTLOOK FOR URANIUM MINING; A special condensation of remarks by Jesse C. Johnson, director of the division of raw materials of the USAEC, at American Mining Congress, San Francisco, Calif., Sept. 22, 1954.

The drive to build up uranium production began early in 1948 when there were billion-dollar wartime plants to produce fissionable material, but an inadequate supply of uranium, the basic raw material.

In 1947, practically all of the U.S.'s uranium came from Eldorado Mining & Refining (Canada) and the Union Miniere du Haut Katanga (Belgian Congo).

Since then, here is a brief review of developments: Private industry in Canada is actively and intensively exploring. Only recently, Gunnar Mines obtained $19,500,000 (in debentures) from private banking sources to finance one of the largest uranium operations in North America. The Blind River area, about 90-miles west of Sudbury, Ontario, promises to be another major uranium source. Plans already are well advanced for one or two operations in the thousand-ton-a-day class there.

South Africa will be one of the world's largest uranium producers. Its gold mines contain large uranium reserves, and undoubtedly there are many reefs yet to be developed. The first of 15 large uranium recovery plants went into production in the Union in October, 1952. The total cost of these plants upon completion of the program will exceed $150,000,000.

Australia was added to the list of uranium producing countries this month with the start of the Rum Jungle mill, near Darwin. The Port Pirie plant in South Australia is expected to begin treating ores from the Radium Hill mine early in 1955. These two operations are government-controlled, but private prospecting is now active in Australia.

Portugal has been producing uranium for several years, and France is obtaining uranium for its atomic energy program from pitchblende veins near Limoges.

In the United States, there have been discovered a dozen or more 100,000-ton ore bodies, as compared with the two or three found in the previous fifty years. There also have been some million-ton deposits discovered. Exploration and production in the U.S. now extend far beyond the original Colorado Plateau, into South Dakota and Wyoming, with exploration also taking place in California and Nevada. Although it is impossible to measure the dollar value of the prospecting and exploration, when this is added to expenditures for production and construction there is in the U.S. at least a $100 million a year uranium industry.

Now consider the market for uranium. While the present demand is entirely for defense, there are prospects for a commercial market. Estimates made for USAEC are that nuclear power capacity in the United States may be 12 million kw. by 1970, 42 million by 1980, and 100 million by 1990. If these figures are reasonable for the U.S., they should be doubled or tripled to arrive at world capacity. What is this in terms of uranium requirements? Inventory requirements for 1,000,000 kw. of electrical capacity is estimated at 600 tons of uranium. If we assume that the uranium would have to be discarded when only 2% has fissioned, or burned up, to operate this 1,000,000 kw. would require about 50-tons of uranium annually as replacement. With a 5% burn-up, annual replacement would be 33 tons; with 10% burn-up only 10 tons of uranium would be required; and if burn-up could be increased to 20%, the annual requirement would be only 5 tons. (While the 2% figure may be too pessimistic, high fuel efficiencies may be many years away.)

When nuclear capacity reaches 100 million kw., which may be near 1980, about 5,000 tons of uranium will be required annually for replacement on the basis of 2% burn-up. By that time, if new capacity is being added at the rate of 15 million kw. per year, annual uranium requirements for reactor inventory will be 9,000 tons. These assumptions indicate a world commercial market for uranium metal of about 14,000 tons a year by 1980.

However, these assumptions make no allowance for the possibility that nuclear plants might replace existing steam plants using high-cost coal. This is a definite possibility in Europe, and even in some areas of the U.S. And a million kw. of electrical capacity consumes about 2,500,000 tons of coal a year. This is the job that may be done with 50 tons of uranium, and, eventually, with much less.

There must also be taken into account that other users of uranium (in addition to public utilities) may be naval vessels and aircraft, plants for which are now being developed.

ATOMIC PATENT DIGEST...latest grants...

GRANTS TO PRIVATE ORGANIZATIONS OR INDIVIDUALS:- Method and device for producing neutron images. Comprises (in part) a vacuum tube enclosing means for receiving an atomic particles image, the means consisting of an atomic particles reactive layer, a luminescent layer, a light transparent conducting separating layer, and a photoemissive layer for converting the particles image into a photoelectron image, the tube further enclosing means for converting the photoelectron image into video signals. U. S. Pat. No. 2,690,516 issued Sept. 28th, 1954, to Edward Emanuel Sheldon, New York, N.Y.

GRANTS TO GOVERNMENT ORGANIZATIONS:- Translating, rotating bearing device. Comprises (in part) three plate members parallel each to the other and separated by ball bearings. The plates are interconnected by guide means in such a manner that the first plate moves with respect to the second plate only in translation, while the second plate moves with respect to the third plate only in rotation. U. S. Pat. No. 2,689,753 issued Sept. 21st, 1954; assigned to United States of America (USAEC). (Inventor: Jacob J. Wechsler.)

Cyclic process for producing water of increased deuterium oxide content. Comprises (in part) contacting steam with a stream of finely divided particles of a metal capable of reducing water under the reaction conditions prevailing, thereby producing deuterium-containing hydrogen and particles of metal oxide; separating the deuterium-containing hydrogen and metal oxide particles; and after additional reactions, reducing the metal oxide particles to metal particles, re-cycling, and withdrawing a portion of the deuterium-enriched water as product. U. S. Pat. No. 2,689,782 issued Sept. 21st, 1954; assigned to United States of America (USAEC). (Inventor: Eger V. Murphree.)

In a telemetering system for transmitting several signals over a single carrier, means for generating electrical impulses of like polarity at even intervals, means for inverting some of these impulses, means for delaying some of these impulses, and means for combining them, whereby four separate, distinct channel identifying codes are generated. U. S. Pat. No. 2,689,949 issued Sept. 21st, 1954; assigned to United States of America (USAEC). (Inventors: John F. Kalbach and Charles W. Johnstone.)

Method of obtaining highly purified uranium oxide from a uranium containing ore. Comprises (in part) digesting the uranium containing ore with nitric acid to produce uranyl nitrate, extracting the uranyl nitrate, evaporating the extract, and heating it to convert it to uranium oxide. U. S. Pat. No. 2,690,376 issued Sept. 28th, 1954; assigned to United States of America (USAEC). (Inventor: James I. Hoffman.)

Process for production of deuterium oxide as a source of deuterium. Comprises (in part) bringing deuterium containing hydrogen and water together in a reaction chamber and catalyzing the equilibrium reaction between them. Additionally, the catalyst may be in a cascade of identical concurrent units. U. S. Pat. No. 2,690,379 issued Sept. 28th, 1954; assigned to United States of America (USAEC). (Inventors: Harold C. Urey and Aristid V. Grosse.)

Isotope exchange process for concentrating deuterium. Comprises the steps of forming a mixture of cyclohexane and hydrogen containing deuterium, causing an exchange of hydrogen isotopes to take place between the cyclohexane and the hydrogen to form cyclohexane enriched in deuterium, and dehydrogenating at least a part of the enriched cyclohexane to obtain hydrogen enriched in deuterium. U. S. Pat. No. 2,690,381 issued Sept. 28th, 1954; assigned to United States of America (USAEC.) (Inventor: Hugh S. Taylor.)

Sincerely,

The Staff,
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